REVIEW

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Covid-19 health crisis and lockdown associated with high level of sleep complaints and hypnotic uptake at the population level

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Abstract

The Covid-19 pandemic has disrupted the habits of billions of people around the world. Lockdown at home is mandatory, forcing many families, each member with their own sleep–wake habits, to spend 24 hr a day together, continuously. Sleep is crucial for maintaining immune systems and contributes deeply to physical and psychological health. To assess sleep problems and use of sleeping pills, we conducted a cross-sectional study of a representative sample of the general population in France. The self-reported sleep complaint items, which covered the previous 8 days, have been used in the 2017 French Health Barometer Survey, a cross-sectional survey on various public health issues. After 2 weeks of confinement, 74% of the participants (1,005 subjects) reported trouble sleeping compared with a prevalence rate of 49% in the last general population survey. Women reported more sleeping problems than men, with greater frequency or severity: 31% vs. 16%. Unusually, young people (aged 18–34 years) reported sleep problems slightly more frequently than elderly people (79% vs. 72% among those aged 35 or older), with 60% of the younger group reporting that these problems increased with confinement (vs. 51% of their elders). Finally, 16% of participants reported they had taken sleeping pills during the last 12 months, and 41% of them reported using these drugs since the lockdown started. These results suggest that the COVID crisis is associated with severe sleep disorders among the French population, especially young people.

KEYWORDS
COVID-19, epidemiology, hypnotics, sleep, sleep problems, young adults

1 | INTRODUCTION

About 3 billion people around the world are currently confined to their homes to limit the spread of Covid-19 (The Lancet, 2020). This unprecedented stressful situation raises the question of its consequences on mental health, given its potential impact on daytime emotional functioning, anxiety and psychological distress. Previous studies showed that quarantines imposed on people potentially exposed to a contagious disease might lead to deleterious psychological effects, including post-traumatic stress symptoms, confusion and anger (Brooks et al., 2020). This situation may also disrupt sleep, which is a crucial physiological, immunological and metabolic balancing factor, regardless of age; disruption of slow-wave sleep could be particularly harmful, (Grandner, 2017; Léger, Debellemaniere, & Rabat, 2018).

Only a few studies have already considered the consequences of the Covid-19 pandemic for sleep disorders. These studies, which

The members of the COCONEL Group are listed in Appendix 1.

were conducted on small samples of people who self-isolated at home for 14 days (Xiao, Zhang, Kong, Li, & Yang, 2020b) or among health professionals treating patients with Covid-19 disease (Xiao, Zhang, Kong, Li, & Yang, 2020a), found significant sleep disorders. The aim of our study was to observe the prevalence of sleep problems in the general population and also to observe how people cope with trouble sleeping during this extraordinary period.

2 | METHODS

2.1 | The survey

The IFOP poll institute, which conducted the COCONEL survey, has access to a permanent panel of 750,000 French households and is authorized by the French National Agency for Data Protection (Commission Nationale Informatique et Libertés) to perform surveys within this panel. IFOP conducted this survey online in a representative subsample of this panel, aged 18+ (*n* = 1,005), to acquire real-time information about the population's reactions to the nationwide Covid-19 lockdown. The survey took place from March 31 to April 2, 2 weeks after the lockdown was implemented in France on March 17, 2020. To limit coverage bias, random sampling was stratified to match official French census statistics for age, gender, geographical area, size of municipality, household income, education level and occupation.

2.2 | Questionnaire

Besides age (less than 35 years old; 35 years and older) and gender, we also used current work status, yearly household income categorized in quartiles (25%/50%/25%), and the average number of people in the household (from one to five or more).

Participants classified themselves into three categories: those with Covid-19, confirmed by a polymerase chain reaction test (PCR-confirmed Covid-19), those with suspected Covid-19 (without PCR confirmation), and those who were not ill with Covid-19.

A panel of experts proposed a set of items exploring sleep difficulties in the context of the lockdown. Because we sought to compare the prevalence of sleep problems in the general population, before and during the confinement period, we used items assessing self-reported sleep problems over the previous 8 days. We used a quality-of-life scale (Parkerson, Broadhead, & Tse, 1990) that has been used since 1995 in five cross-sectional surveys among the general population in France (Health Barometers of Public Health France, Santé Publique France) (Beck, Léon & Leger, 2009; Beck, Richard, & Léger, 2013; Léger, Zeghnoun, Faraut, & Le Richard, 2019).

Sleep items were as follows: Have you been having trouble sleeping during the last 8 days (not at all; yes, a little; yes, a lot)? *If yes*: have these problems increased since the lockdown (yes, a lot; yes, a little; no, not really; not at all; don't know)? *If yes*: have these sleep

problems and the resulting fatigue affected your daily activities (work or leisure) (not at all; yes, a little; yes, a lot; don't know)? Over the last 12 months, have you taken sleeping pills or drugs for sleep (yes; no; don't know)? *If yes*: was it before the lockdown, after, or both (before; after; both)?

2.3 | Analysis

Data were weighted to ensure representativeness based on gender, age, geographical area, size of municipality, household income, education level and occupation. Associations between the sleep items and sociodemographic variables and comparisons between the Health Barometer Survey (conducted before the lockdown) and the COCONEL survey (conducted after the lockdown) were tested with Pearson's chi-squared test.

3 | RESULTS

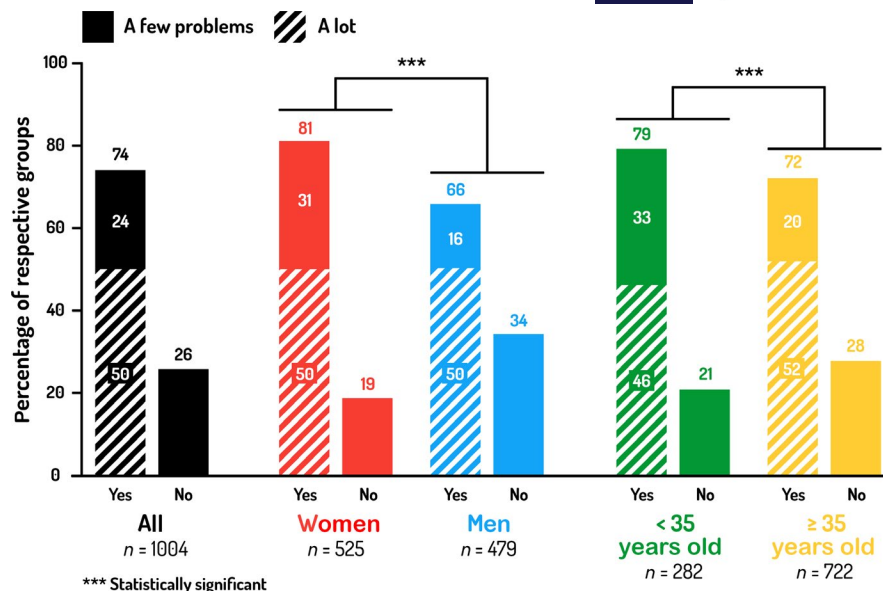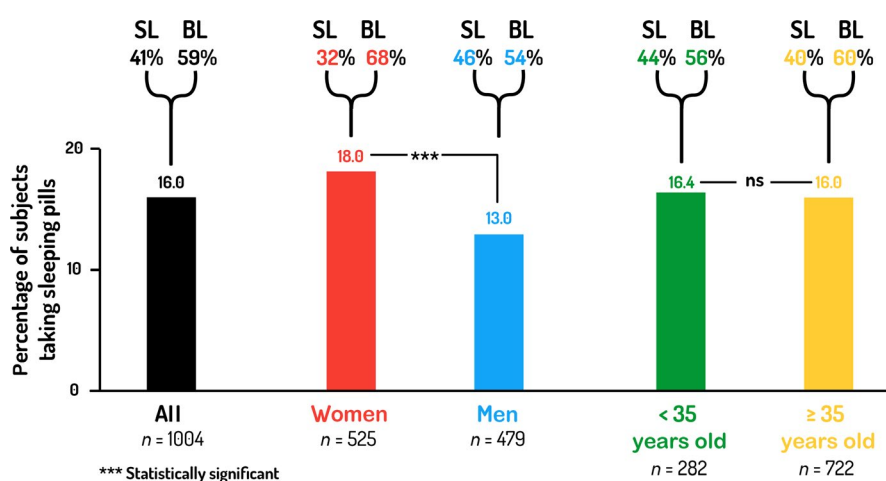### 3.1 | Sociodemographic characteristics and Covid-19 status

Overall, 52% of the participants were women, 26% were younger than 35 years and 51% had been working before the confinement order. The distribution of the number of persons per household was as follows: one person (24%), two (39%), three (15%), four (13%), and five or more (9%). Only 1% of participants reported they had PCR-confirmed Covid-19, whereas 9% had suspected Covid-19. The remaining 90% did not, to their knowledge, have Covid-19 at the time of the interview.

3.2 | Trouble sleeping

3.2.1 | Trouble sleeping during the past 8 days

Nearly three-quarters of the participants in this survey (74%) reported sleep problems during the 8 days before the survey (i.e., during the lockdown) (Figure 1). Two-thirds of them (50% of the entire sample) felt they had "some" trouble sleeping and the remaining third (24% overall) "a lot of trouble". Women had trouble sleeping more often than men and in particular reported the most severe or intense problems: 31% of women complained of a lot of trouble sleeping, compared with only 16% of men (*p* < .0001). Young people (<35 years old) reported trouble sleeping slightly more frequently than elderly people (79% vs. 72% of those aged 35+, *p* < .0001).

Sleep problems were significantly more prevalent and severe among the individuals in the lowest income quartile (overall, 82%; severe, 35%) than among the highest income quartile (overall, 68%; severe, 16%) (*p* < .0001). Sleep problems also varied slightly but significantly according to household size (*p* = .01).

FIGURE 1 Sleep complaints during the last 8 days

FIGURE 2 Intake of sleeping pills. SL, since lockdown; BL, in the month before lockdown

For 62% of the people reporting sleep disorders in the survey, poor sleep was associated with some impairment of their daytime daily activities. The prevalence of this impairment was highest among the most disadvantaged households (80%, $p < .0001$), the young people (70%, $p < .01$) and the unemployed (68%, $p = .04$).

Among patients with Covid-19, 89% of those with PCR-confirmed illness reported sleep problems (52% severe), and 81% of those with suspected Covid-19 (15% severe) ($p = .004$).

3.2.2 | Sleeping pills during the past 12 months

Use of sleeping pills over the previous 12 months was reported by 16% of the respondents, and in women more frequently than in men (18% vs. 13%, $p = .02$); (Figure 2). This use did not differ significantly between household income categories. Among the 10% of participants reporting Covid-19, 60% of those with PCR-confirmed illness and 20% of those with suspected Covid-19 reported taking sleeping pills in the past 12 months.

3.2.3 | Trouble sleeping and sleeping pills since lockdown

Among those who reported sleep problems in the previous 8 days, 54% indicated that these problems had increased since the lockdown (Figure 3), a percentage that was nearly identical among women and men (54%–53%). This was more frequently true for young people (<35 years) (60%) than for elderly people (51%, $p = .02$), but did not differ significantly between household-income categories.

Among those who had taken sleeping pills in the last 12 months, 41% reported taking them since the lockdown: 32% for women vs. 46% for men ($p < .001$) (Figure 3).

3.2.4 | Comparison with the 2017 dataset

In 2017, the rate of complaints of trouble sleeping during the previous 8 days among the general population was 49%, significantly

lower than the 74% rate of this survey (*p* < .0001), with a higher rate of complaints in women (53%) than in men (44%).

Regarding younger subjects (18–34 years old), in 2017 the rate of complaints was 43%, compared with 79% in the present study (*p* < .0001).

4 | DISCUSSION

Our survey, conducted a month after the Covid-19 pandemic hit France and 9 days after the mandatory lockdown started, found a high rate of complaints of trouble sleeping during the previous 8 days among the general population: 74% (81% among women, 66% among men, *p* < .0001).

Reports of trouble sleeping thus increased by about 50% after the confinement, compared to the most recent prevalence. This is consistent with the percentage of respondents (53%) who reported greater trouble sleeping during the confinement. The sex ratio was similar to previous findings in the Health Barometers Survey and with previous publications that have shown a higher prevalence of sleeping problems among women than men (Beck et al., 2013; Léger et al., 2019).

Contrary to previous observations among the general population, young people reported the highest rate of disorders. This finding suggests that young people may be more vulnerable to the conditions of confinement and/or a health crisis, as found in previous studies: they may suffer more than the rest of the population from the isolation resulting from social distancing, as well as experience direct economic consequences for those with precarious jobs (Taylor, Agho, Stevens, & Raphael, 2008). A recent publication on Chinese students suggested that this vulnerability may be linked to the impact of the pandemic on their studies, including organizational changes, delays in study programmes and fears about being able to continue their schooling, given the economic catastrophe accompanying the public health crisis. (Cao et al., 2020). All of these factors might reinforce the fear of a disrupted future among youth.

The confinement due to Covid-19 has probably changed our way of sleeping and how we cope with our 24-hr biological clock, to an extent that remains to be assessed. Public health researchers have been deeply concerned about sleep debt in young adults (Léger, Beck, Richard, & Godeau, 2012). With the Covid-19 epidemic and the lockdown, they must probably face new kinds of sleep problems in young people, despite sufficient time in bed, possibly because of the post-traumatic nature of this event. Its medium and long-term impact will have to be monitored.

Disadvantaged people were significantly more likely to suffer from sleep disturbances than others (in the lowest quartile, 82% overall, 35% severe, vs. 72% and 21% in the (Q1 to max)/entire population; *p* < .0001, respectively). This group is already experiencing more economic consequences of the lockdown (Chung et al., 2020). We know that coping with disasters may be more difficult for these population categories than for the more affluent (Rivière et al., 2008). Higher social capital is a protective factor against the consequences of traumatic situations and is associated with better sleep quality by reducing anxiety and stress (Xiao et al., 2020b). Moreover, unfavourable housing conditions (overcrowding and precariousness, in particular) often involve disruptive sleep (Léger, Beck, & Richard, 2017).

Finally, 16% of the participants reported they had taken sleep medications in the past 12 months, and among them, 41% since the start of confinement, consistent with their higher prevalence of sleep problems. Because of the isolation that most people have faced since the beginning of the lockdown, hypnotic and/or anxiolytic drugs may appear to be the most easily available solution. Practitioners and psychiatrists may have been more prone to prescribe these drugs than to recommend non-pharmacological treatment to their patients. We need careful medical follow-up of these people to avoid lasting (and increasingly ineffective) sleeping pill consumption, and to detect possible post-traumatic symptomatology. Cognitive behavioural therapy is still the most highly recommended treatment for insomnia (Altena et al., 2020). How to offer it and its effectiveness in the current situation of confinement are questions that must be answered.
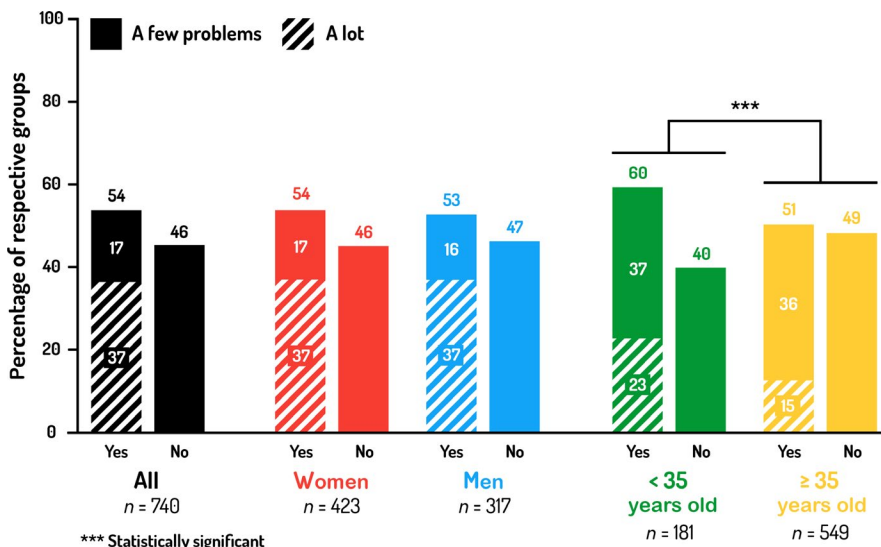

FIGURE 3 Sleep problems increased since the lockdown

One potentially major finding (from a small number of cases) is the very high rates of PCR-confirmed (89% overall, 52% severe) and suspected Covid-19 patients (81% overall, 15% severe) who reported sleep problems. Moreover, 60% of the PCR-confirmed and 20% of the suspected patients had been taking sleeping pills over the past 12 months. Nonetheless, this concerned only a few people and we were not able to test whether differences were significant. Multiple hypotheses may explain the rationale for this association: fever, stress and anxiety. It is also essential to understand the extent to which poor sleep may be a risk factor in the occurrence and severity of Covid-19. The high rate of sleeping complaints and sleeping pill use among people with confirmed or suspected Covid-19 will have to be confirmed in larger samples. Given the traumatic nature of the epidemic and of the lockdown, as well as the important risk perception and uncertainties associated with the lack of treatment for the moment, infection by SARS-CoV2 can have a major impact on mental health.

Besides the public health issues directly linked to Covid-19, we believe that the rapid detection and prevention of sleep disorders is important, insofar as they may be both (i) considered a first signal of psychiatric imbalance, anxiety, depression or suicidal thoughts and (ii) deleterious for COVID prevention and recovery.

Finally, our results suggest that the COVID crisis is associated with severe sleep disorders among the French population, especially the young and disadvantaged people. This unprecedented event is thus likely to profoundly increase social inequalities in health.

CONFLICTS OF INTEREST
No conflicts of interest declared.

AUTHOR CONTRIBUTIONS
All authors are justifiably credited with authorship and participated in the conception, design, analyses, interpretation, manuscript drafting and final approval.

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APPENDIX 1

ABOUT THE COCONEL GROUP

The COCONEL Group includes: Patrick Peretti-Watel[1,2] (scientific coordinator), Valérie Seror[1], Sébastien Cortaredona[1], Lisa Fressard[1], Odile Launay[3], Jocelyn Raude[4], Pierre Verger[2] (research consortium), François Beck[5], Stéphane Legleye[5], Olivier L'Haridon[6], Jeremy Ward[1-7] and Damien Léger[8,9] (steering committee).

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